

IN THE CLAIMS

The pending claims are as follows:

1.-50. (Cancelled)

51. (Currently Amended) A via, comprising:

a continuous electrically conductive, titanium alloy layer formed overlying walls and an exposed base layer of a contact hole, the titanium alloy layer having a similar chemical profile in walls and a base portion of the titanium alloy layer;

a barrier layer coupled to the titanium alloy layer; and

a fill coupled to the barrier layer, wherein the fill comprises a metal selected from the group consisting of tungsten and aluminum.

52. (Original) The via of claim 51, wherein the titanium alloy layer comprises titanium and zinc.

53. (Currently Amended) A via, comprising:

a continuous electrically conductive, titanium alloy layer formed overlying walls and an exposed base layer of a contact hole, the titanium alloy layer having a similar chemical profile in walls and a base portion of the titanium alloy layer, wherein the titanium alloy layer comprises titanium and an element selected from the group consisting of zinc, cadmium, mercury, aluminum, gallium, indium, tin, silicon, germanium, lead, arsenic and antimony;

a barrier layer coupled to the titanium alloy layer; and

a fill coupled to the barrier layer, wherein the fill comprises a metal selected from the group consisting of tungsten and aluminum.

54. (Previously Presented) The via of claim 51, wherein the barrier layer includes a titanium nitride layer interposed between the titanium alloy layer and the fill.

55. (Currently Amended) A via, comprising:

a continuous electrically conductive, titanium alloy layer formed overlying walls and an exposed base layer of a contact hole, the titanium alloy layer having a similar chemical profile in walls and a base portion of the titanium alloy layer;

a fill comprising a metal selected from the group consisting of tungsten and aluminum; and

a titanium nitride layer interposed between the titanium alloy layer and the fill.

56. (Currently Amended) A via, comprising:

a continuous electrically conductive, titanium alloy layer formed overlying walls and an exposed base layer of a contact hole, the titanium alloy layer having a similar chemical profile in walls and a base portion of the titanium alloy layer, wherein the titanium alloy layer comprises titanium and an element selected from the group consisting of zinc, cadmium, mercury, aluminum, gallium, indium, tin, silicon, germanium, lead, arsenic and antimony;

a fill comprising a metal selected from the group consisting of tungsten and aluminum; and

a titanium nitride layer interposed between the titanium alloy layer and the fill.

57.-59. (Cancelled)

60. (Currently Amended) A via, comprising:

a first layer of a continuous electrically conductive, titanium alloy within a contact opening in an insulating layer, the first layer having a similar chemical profile in walls and a base portion of the first layer, wherein the titanium alloy comprises titanium and an element selected from the group consisting of zinc, cadmium, mercury, aluminum, gallium, indium, tin, silicon, germanium, lead, arsenic and antimony;

a second layer of titanium silicide coupled to the first layer; and

a fill coupled to the titanium alloy layer, wherein the fill comprises a metal selected from the group consisting of tungsten and aluminum.

61. (Original) The via of claim 60, wherein the first layer includes a titanium zinc alloy.

62. (Original) The via of claim 60, further including a titanium nitride layer interposed between the titanium alloy layer and the fill.

63. (Original) The via of claim 60, wherein the first layer is coupled to a sidewall of the contact opening.

64. (Original) The via of claim 60, wherein the second layer is coupled to an exposed semiconductor surface.

65. (Original) The via of claim 60, wherein the contact opening includes a high aspect ratio contact opening.

66. (Currently Amended) A via, comprising:

a first layer of a continuous electrically conductive, titanium alloy within a high aspect ratio contact opening in an insulating layer, the first layer having a similar chemical profile in walls and a base portion of the first layer, wherein the titanium alloy comprises titanium and an element selected from the group consisting of zinc, cadmium, mercury, aluminum, gallium, indium, tin, silicon, germanium, lead, arsenic and antimony;

a second layer of titanium silicide coupled to the first layer; and

a fill coupled to the titanium alloy layer, wherein the fill comprises a metal selected from the group consisting of tungsten and aluminum.

67. (Original) The via of claim 66, wherein the first layer includes a titanium zinc alloy.

68. (Original) The via of claim 66, further including a titanium nitride layer interposed between the titanium alloy layer and the fill.

69. (Original) The via of claim 66, wherein the insulating layer includes borophosphorous silicate glass (BPSG).

70. (Original) The via of claim 66, wherein the insulating layer includes silicon dioxide (SiO₂).

71. (Original) The via of claim 66, wherein the first layer is coupled to a sidewall of the high aspect ratio contact opening.

72. (Original) The via of claim 66, wherein the second layer is coupled to an exposed semiconductor surface.

73. (Original) A via, comprising:
a first layer of an electrically conductive, titanium zinc alloy on a sidewall of a high aspect ratio contact opening in an insulating layer;
a second layer of titanium silicide formed overlying an exposed semiconductor base layer of the contact hole;
a fill coupled to the titanium zinc alloy layer, wherein the fill comprises a metal selected from the group consisting of tungsten and aluminum.

74. (Cancelled)

75. (Original) The via of claim 73, further including a titanium nitride layer interposed between the titanium zinc alloy layer and the fill.

76. (Original) The via of claim 73, wherein the insulating layer includes borophosphorous silicate glass (BPSG).

77. (Original) The via of claim 73, wherein the insulating layer includes silicon dioxide (SiO₂).

78. (Original) A via, comprising:

a first layer of an electrically conductive, titanium zinc alloy within a contact opening in an insulating layer, wherein the first layer is produced using a method including:

forming a seed layer supported by a substrate by combining a first precursor with a first reducing agent;

forming the titanium layer supported by the substrate by combining a titanium-containing precursor with the seed layer; and

filling the remaining space of the contact opening with a metal selected from the group consisting of tungsten and aluminum.

79.-80. (Cancelled)

81. (Original) The via of claim 78, further including a second layer of titanium silicide coupled to the titanium zinc alloy.

82. (Original) The via of claim 78, further including a titanium nitride layer interposed between the first layer and the fill.

83. (Original) The via of claim 81, further including a titanium nitride layer interposed between the second layer and the fill.

84. (Original) The via of claim 78, wherein the first layer is coupled to a sidewall of the contact opening.

85. (Original) The via of claim 78, wherein the first layer is coupled to a high aspect ratio contact opening.